TENCOMPETENCE TRAINING APPROACH

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1 Introduction

Knowledge society demands continuous competence development and management at the individual-, group- and organizational level. These levels represent distinct fields with their own approaches and tooling, but integrated support for informal and formal learning is missing. TENCompetence is a 4 year EU-funded IST-TEL project (http://www.tencompetence.org) that has the aim to build a technical and organizational infrastructure for lifelong competence development [1]. The TENCompetence infrastructure will be based on Open Source Software (OSS) and Open Standards [2]. OSS services can be replaced by commercial ones and this infrastructure should be self-sustainable after the project period. A network of core and associate partners will provide commercial and non-commercial services using this infrastructure.

This paper presents a training approach for the TENCompetence future users, (prospective) associate partners and the consortium members. The TENCompetence infrastructure will support both the emergence and sustainability of learning networks as well as a more design-driven approach to competence development, and this will be reflected in the training activities. Our aim is to train not only people closely related to the project, but the focus will shift towards a) providing training to organizations and service providers who will run independent real-life demonstrator pilots, including all the technical tasks involved, and b) training associate partners to become service providers to sustain, through the future TENCompetence Foundation, the TENCompetence infrastructure.

Paragraph 2 describes the training objectives, the TENCompetence principles, and their overall implications for the training roadmap. Paragraph 3 identifies the critical audiences in relation to the project structure and the future TENCompetence Foundation, as well as the roles to be fulfilled by these various audiences in developing, servicing and using the TENCompetence infrastructure. Paragraph 4 outlines the training activities for users and prospective users, while Paragraph 5 describes the training activities for partners and associate partners to develop and sustain the TENCompetence infrastructure.

2 General Training Objectives

Training activities within the project have the following objectives: 1. To promote and enable the use of the TENCompetence infrastructure, i.e. targeting future end-users and adopting organizations. 2. To prepare a network of future TENCompetence service providers (the TENCompetence Foundation) to sustain the TENCompetence infrastructure. 3. To support the exchange of knowledge and competence development within the TENCompetence community of core partners and fellow researchers, including Ph.D. students. Furthermore the TENCompetence project objectives provide a number of pointers to how competence development will be organised an executed:

project objective #	project objectives description	TENCompetence training implications
1	To provide an easy-to-use, integrated, open-source, standards-based, extensible and sustainable European infrastructure for lifelong competence development.	Apply the TENCompetence infrastructure as soon as it is becomes available to provide the training activities, and use the lessons learned from this as input to the next cycle release (internal pilot).
2	Perform real-life pilot implementations in different organizational and international settings.	Offer training to prospective participants in real-life pilot implementations in different organizational and international settings. This

		training in principle addresses the competences related to all roles involved in setting-up, maintaining, running and using the TENCompetence infrastructure within such pilots.
3	To ensure the sustainability of the infrastructure by creating training opportunities for new innovative European organizations in the field of lifelong competence development.	Not only target existing educational and training organizations as prospective users of the infrastructure in the training activities, but especially focus on innovative SMEs in preparing for sustainability. These include 'interested' parties as well as those wanting to become associate partners.
4+5+6 +7+8	To support research and development by appropriate training in the four main research areas and underlying research fields: Knowledge Resource Sharing & Management, Learning Activities & Units of Learning, Competence Development Programmes, and Networks for Lifelong Competence Development.	Apply the TENCompetence infrastructure and provide training opportunities to create and share new scientific knowledge within the consortium, and together with peers external to the project (including PhD students).
9	To execute a coordinated plan of training activities to aid European and international adoption of the project results.	This in fact reflects the training mandate.
10	To provide input to international, national and professional standardisation bodies.	How to use these standards will be a training topic.

Table 1: TENCompetence training principles

The TENCompetence system will provide training opportunities for on-line, face-to-face and blended competence development situations, including social and collaborative scenarios.

3 Target Audiences and Roles

Based on the general training objectives and approach as described in the previous paragraph, the following audiences are defined in terms of their proximity to the present consortium partners:

- ***Subscribers*** who have an active interest in the TENCompetence activities and outcomes, and who include decision makers, entrepreneurs, educational institutions, etc.
- ***Users*** - individuals as well as adopting organizations - of the TENCompetence infrastructure.
- ***Associate partners***, who have committed themselves to active participation in one or several activities or the TENCompetence project or the future TENCompetence Foundation as co-developers and/or service providers.
- ***Consortium partners***, including development staff, researcher staff and Ph.D. students.

Training for users and subscribers inherently will depend on the product delivered by the project - the integrated infrastructure. Training for these groups will focus on how to use the TENCompetence infrastructure as it will be delivered through a number of different releases during the project life cycle. To make such a training meaningful, it should be contextualised to the specific groups, e.g. by economic sector, educational setting, national, context, etc.

Associate partners and consortium partners perform various roles in developing, testing, maintaining, and exploiting the TENCompetence infrastructure, either within the consortium during the project life cycle, or after termination of the project through the TENCompetence Foundation. Based on the experiences during the first twelve months, seventeen profiles have been defined so far: Requirements analyst, Architectural designer, Interface/interaction designer, System developer, Software tester, Database manager, System manager, Pilot designer and evaluator, Trainer, Public relations officer, Pedagogical expert, Learning technology expert, Work package manager, TENCompetence project member, Business manager, Human resource manager, and Services provider.

Figure 1 depicts the TENCompetence audiences, contexts, and profiles targeted by training activities: Over the full 48-month project execution period, training emphasis will move from the ‘center’ of the core partners, through associate partners, to the subscribers and the (potential) end users as the project moves through the phases of ‘proof of concept’ (cycle 1), ‘usability’ (cycle 2) and ‘sustainability’ (cycle 3). At the same time it is expected that the TENCompetence Foundation will gain in importance and start taking over the consortium responsibilities, also requiring training.

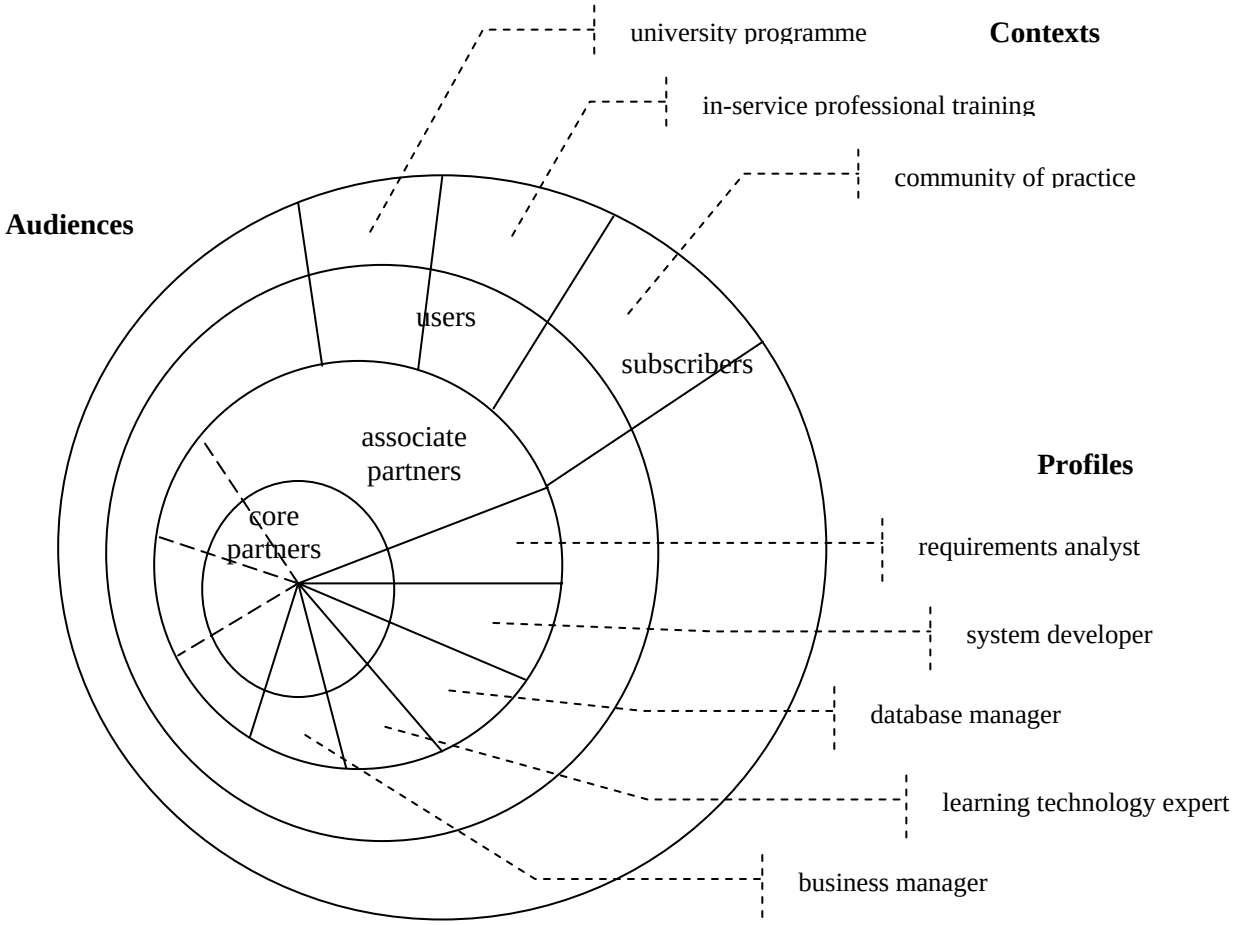

Figure 1: TENCompetence audiences, profiles and contexts.

4 Training for Users and Subscribers

In the first phase ***user training*** will concentrate on those who will participate in the project pilots, mainly as end-users (learners, experts). These pilots will target different competence development contexts: professionals requiring new competences in the area of the Digital Cinema and Health Care; a community of practice in Water Management; cross-sectoral cooperation at city level; and a more traditional training setting to acquire ICT skills.

Training for ***subscribers and potential adopters*** will especially focus on those who will have an important vote in the final uptake of the system (policy makers, entrepreneurs, universities, training institutions, etc) by familiarising them with the actual system, its components, and underlying concepts. Dedicated and contextualised presentations, training sessions, and workshops will be organized for them according to their needs to find ground for strategic decision making, to translate TENCompetence ideas and instrumentation to their branches, and to show how to implement TENCompetence in pilots and in their education.

In addition to pilots with ‘external audiences’ the application of the TENCompetence architecture will be treated as a pilot on its own to facilitate the creation of a shared and full understanding of the TENCompetence infrastructure by partners and associate partners.

5 Training for Core and Associate Partners

For core and associate partners, the training targets the researchers (who investigate issues in the field of lifelong competence development and in related areas, including PhD students) as well as the developers and future service providers of the TENCompetence infrastructure, with the aim to sustain the project outcomes. Business partners may also belong to this category because they gain specific know-how from academic partners and provide them with valuable feedback regarding implementation issues.

For ***researchers*** specific Competence Networks will be developed in the project, applying the TENCompetence infrastructure. The TENCompetence Network of PhD students was already established at the beginning of the project and will be further maintained to support research exchange in the academic community. Its objective is to facilitate communications between PhD students and other researchers and to encourage knowledge sharing. This target group consists mainly of PhD students and their supervisors dealing with issues related to the TENCompetence project, but it is also open to other people who would like to become involved.

Researchers can establish Competence Networks that focus on a specific field, e.g. Latent Semantic Analysis, mobile learning, recommender systems, social software, IMS Learning Design, etc. Within such a Competence Network they can collect relevant resources, annotate them, discuss on open issues, find colleagues for collaboration, learners can get guidance and advice from experts, etc. In addition to remote cooperation they can jointly organize and attend live events as well. To keep the Network alive and active, events will be organised on a regular basis, either virtual (video conferences, on demand lecture series) or live ones (winter school, workshops, tutorials).

Present and future ***developers and service providers*** are made up of the Consortium and Associate Partners - in particular SMEs - who will assist with the development and delivery of the TENCompetence outcomes and services. These partners are crucial to the successful development, take-up, and sustainability of the project, as they will help us to create the TENCompetence organizational infrastructure. The TENCompetence Network for Associate Partners has been set up for them and will be actively supported through involving them in development, piloting and evaluation activities. Training activities will focus on developers of services, producers of learning resources, trainers, and service providers. Emphasis will be put on the technical roles required in the pilots, i.e. for each cycle a training program will be designed and executed.

At the moment these researchers and developers are still consortium partners, but over time it is expected more Associate Partners will join, and through the Foundation contribute to the further development and sustainability of the TENCompetence infrastructure. Present training needs within the Consortium therefore are expected to reflect future training needs for associate partners, and as such the materials and lessons learned from the internal training activities will be repurposed for training activities targeted at external audiences.

Through questionnaires and TENCompetence closed workshop sessions, 24 internal training needs were identified during the first phase of the project. A number of these topics (e.g. Knowledge management, Competence development programmes, Unified Modeling Language & RUP, IMS Learning Design) have been covered during the first major training activity, the one-week Winter School in January 2007. Based on the received feed-back a selected number of Competence Networks will be set up. The first network, focussing on Service Oriented Architecture, has already been initiated by the Consortium PhD students.

In addition to this ‘demand-driven’ approach in identifying training needs, TENCompetence principles and tools will be applied to assess competence and define competence gaps within the Consortium and the future Associate Partners through the following procedure: 1. List all TENCompetence WP tasks, 2. Define competence profiles required in the consortium: TENCompetence Competence Map, 3. Staff uses the competence map to do a self-assessment, 4. Create and populate the Tasks x Competences Matrix, 5. Analyse the outcomes (gap analysis), 6. Prioritise competence development needs, 7. Identify expert facilitators within the Consortium, 8. Establish Competence Networks for these topics.

5.1 TENCompetence Competence Map

In Paragraph 3 we identified the roles involved in the execution of the TENCompetence project and the operation of the future TENCompetence Foundation. Linked to these roles an initial set of competences and their proficiency levels were defined in the form of a TENCompetence Competence Map. Each competence can be scored at five proficiency levels: 0-4. For the profile of System Manager for example this results in the following row in the competence map:

No	***Profile***	***Competences***	***Score***
7	*Systems Manager*	Given the software that has to be implemented to be usable for end users: a. Be able to setup a test or production server (install operating system, software/web services, security, backups, connect to database servers, etc.) b. Be able to setup an mechanism to manage users and provide secure access to users. c. Be able to maintain, backup and monitor the services according to the agreed upon service levels.	 0 1 2 3 4 0 1 2 3 4 0 1 2 3 4

Table 2: Competence map for the role of Systems Manager

The principles applied in devising the Competence Map are detailed next. In TENCompetence we distinguish five competences classes [3]: *Cognitive competences* (e.g. strategical knowledge of the field, knowledge of sub-domains), *Functional competences* (e.g. UML modeling, technical design, programming, development of standards, server setup and maintenance, system tests, evaluations, dissemination), *Personal competences* (e.g. creativity, originality, flexibility), *Ethical competences* (e.g. commitment to the project mission, empathy with education), and *Trans/meta competences* (e.g. communication, writing, planning, collaboration, learning to learn). Each competence class is defined through its attributes, which are derived from the TENCompetence Domain Model: Name, Worldwide unique ID, Competence description (free text – in general, independent of the proficiency level, e.g. psychological intervention competence), Creator (the actor who has specified the competence), Competence type (free text, e.g. cognitive competence, transversal competence, functional competence; knowledge, skill, ability, task), Proficiency level(s), (Owner – in which job context the function/job level requirements are defined).

An individual may exhibit competences at the following proficiency levels: 0 = none, 1 = can apply this with support in a relatively simple and well organized situation, 2 = can apply this independently in a relatively simple and well organized situation, 3 = can apply this independently in complex situations, 4 = can apply this flexible in complex situations, can evaluate the competence and can support others. The Competence Map comprises a temporary ‘work version’ within the project. Over time it is likely to change under the influence of lessons learned and new development in the TENCompetence environment. How to incorporate such changes in existing competence networks is one of the challenges to be addressed by the project. The Competence Map for self assessment has been distributed amongst all TENCompetence staff to be analysed in the next phase.

5.2 Competence Gap Analysis and Partner Positioning

Once the self assessment maps have been collected, they will be mapped against the required competences related to the specified tasks. Figure 2 shows an excerpt of such a matrix of WP tasks against profiles and competences. This will serve as the basis for defining training priorities and setting up Competence Networks.

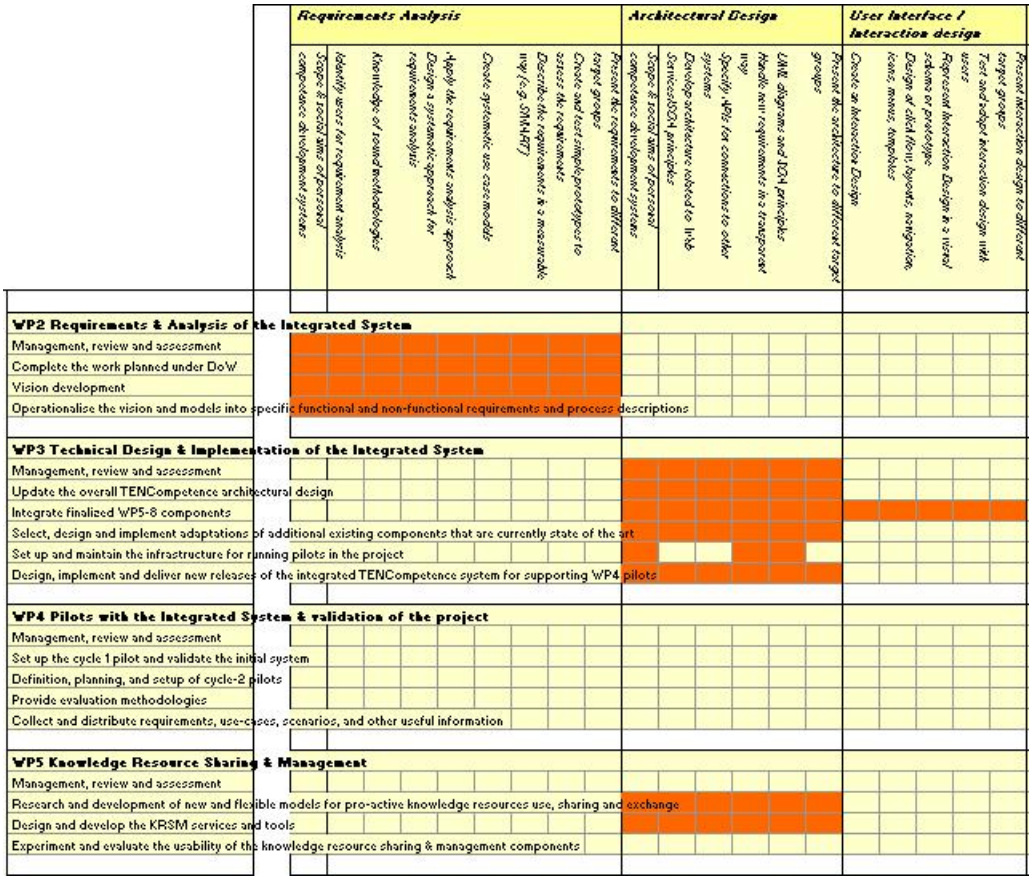

Figure 2. WP Tasks x Competences Matrix

Initially the competence gap analysis is carried out 'manually' on paper. At a later stage, computer supported services will become available for competence definition, positioning, navigation, and recommending. Together these integrated services will constitute the Personal Competence Manager (PCM). This PCM will also work with the TENCompetence Competence Map. The first version of the PCM will only support two proficiency levels: true (score 4) and false (scores 0-3). At a later stage, the same procedure may be used by Associate Partners to self-assess their competence profiles for participation in TENCompetence, and participation in competence development activities (be it as learner or as provider).

6 Conclusion

This paper describes the TENCompetence training approach that is based on competence mapping and gap analysis. On the basis of the prioritised competence development needs, experts will be identified (according to the self assessment) within the consortium to serve as facilitators in setting up Competence Networks. The first version of the TENCompetence infrastructure will be used to implement these Networks.

References:

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